

CLAIMS

1. A white conductive primer coating composition comprising:

5 (a) 100 parts by weight of a resin mixture of a chlorinated polyolefin resin with a chlorine content of 10 to 40 wt.%, and at least one modifier resin selected from the group consisting of acrylic resins, polyester resins and polyurethane resins;

10 (b) 5 to 50 parts by weight of a crosslinking agent; and

(c) 10 to 250 parts by weight of a white conductive titanium dioxide powder which comprises titanium dioxide particles having on their surfaces a conductive layer comprising
15 tin oxide and phosphorus, and in which the content (A) of metallic elements with valencies of 4 or less contained as impurities is no more than 0.1; the content (A) being calculated by the following formula (1)

20 Formula (1): $(A) = (M_1) \times (4 - n_1) + (M_2) \times (4 - n_2) + (M_3) \times (4 - n_3) + (M_4) \times (4 - n_4) + \dots + (M_X) \times (4 - n_X)$

wherein $M_1, M_2, M_3, M_4, \dots, M_X$ are the atomic ratios of metallic elements with valencies of 4 or less to Sn of the tin oxide in
25 the white conductive titanium dioxide powder; $n_1, n_2, n_3, n_4, \dots, n_X$ are the valencies of metallic elements having atomic ratios of $M_1, M_2, M_3, M_4, \dots, M_X$, respectively; and X in M_X and n_X is the number of such metallic elements contained in the white
conductive titanium dioxide powder, and may be a natural number 1
30 or more.

2. A primer coating composition according to claim 1, wherein, in component (a), the proportions of the chlorinated polyolefin resin and modifier resin are 10 to 90 wt.% and 90 to
35 10 wt.%, respectively, of the total weight of these resins.

3. A primer coating composition according to claim 1, wherein, in the white conductive titanium dioxide powder (c), the amount of tin oxide in the conductive layer is 0.015 to 0.3 g on a SnO₂ basis per square meter of surface area of the titanium
5 dioxide.

4. A primer coating composition according to claim 1, wherein, in the conductive layer of the white conductive titanium dioxide powder (c), the proportion of phosphorus to tin oxide is
10 from 0.10 to 0.50 in terms of the P/Sn atomic ratio.

5. A primer coating composition according to claim 1, wherein, in the white conductive titanium dioxide powder (c), the content (B) of metallic elements with valencies of 4 or less
15 contained as impurities in the titanium dioxide is no more than 0.02; the content (B) being calculated by the following formula (2):

Formula (2): $(B) = (M'_1) \times (4 - n'_1) + (M'_2) \times (4 - n'_2) + (M'_3) \times (4 -$
20 $n'_3) + (M'_4) \times (4 - n'_4) + \dots + (M'_Y) \times (4 - n'_Y)$

wherein $M'_1, M'_2, M'_3, M'_4, \dots, M'_Y$ are the atomic ratios of metallic elements with valencies of 4 or less to Ti of the titanium dioxide; $n'_1, n'_2, n'_3, n'_4, \dots, n'_Y$ are the valencies of
25 metallic elements with atomic ratios of $M'_1, M'_2, M'_3, M'_4, \dots, M'_Y$, respectively; and Y in M'_Y and n'_Y is the number of metallic elements contained in the titanium dioxide, and may be a natural number 1 or more.

30 6. A primer coating composition according to claim 1, further comprising (d) up to 200 parts by weight of a white pigment.

7. A primer coating composition according to claim 1,
35 the composition being capable of forming a coating layer with a

lightness (L^* value) of 80 or more as determined according to the $L^*a^*b^*$ color system defined in JIS Z 8729, by being applied to a plastic substrate and cured by heating.

5 8. A primer coating composition according to claim 1, the composition, when formed into an uncured or cured coating layer applied on a plastic substrate, having a surface electrical resistance less than $10^9 \Omega/\text{sq}$.

10 9. A primer coating composition according to claim 1, which is an aqueous coating composition.

10. A method for forming a multilayer coating film, the method comprising the steps of:

15 (1) applying a white conductive primer coating composition according to claim 1 to a plastics substrate;

 (2) electrostatically applying a colored base coating composition on the uncured coating layer of the primer coating composition;

20 (3) electrostatically applying a clear coating composition on the uncured coating layer of the base coating composition; and then

 (4) curing by heating the three-layer coating comprising the primer coating composition, colored base coating
25 composition and clear coating composition.

11. A method for forming a multilayer coating film, the method comprising the steps of:

 (1) applying a white conductive primer coating
30 composition according to claim 1 to a plastics substrate, followed by curing by heating;

 (2) electrostatically applying a colored base coating composition on the cured coating layer of the primer coating composition;

35 (3) electrostatically applying a clear coating

composition on the uncured coating layer of the base coating composition; and then

(4) curing by heating the two-layer coating comprising the colored base coating composition and clear coating composition.